

WHAT IS CLAIMED IS:

1. A thin film transistor array panel comprising:
an insulating substrate;
a plurality of control lines provided on the substrate and including first
5 and second control lines;
a plurality of data lines provided on the substrate and including first and
second data lines;
a pixel electrode provided on the substrate and having a cutout;
a field control electrode provided on the substrate and overlapping the
10 cutout;
a first switching element for applying a first signal from the first data line
to the pixel electrode in response to a first control signal from the first control line;
and
a second switching element for controlling a second signal to be applied to
15 the field control electrode.
2. The thin film transistor array panel of claim 1, wherein the first and the
second switching elements are active at different times.
3. The thin film transistor array panel of claim 2, wherein the second
switching element is active before the first switching element.
- 20 4. The thin film transistor array panel of claim 3, wherein the first
switching element becomes active immediately after the activation of the first
switching element.
5. The thin film transistor array panel of claim 3, wherein the second
signal is supplied from one of the data lines and the second switching element
25 applies the second signal to the field control electrode in response to a second
control signal from the second control line.
6. The thin film transistor array panel of claim 5, wherein the second
signal is supplied from the first data line.
7. The thin film transistor array panel of claim 5, wherein the second
30 signal is supplied from the second data line, and the second data line is adjacent to
the first data line.
8. The thin film transistor array panel of claim 1, wherein the field control
electrode overlaps the pixel electrode.

9. The thin film transistor array panel of claim 1, wherein the field control electrode and the control lines include substantially the same layer.

10. The thin film transistor array panel of claim 1, wherein the field control electrode and the data lines include substantially the same layer.

11. The thin film transistor array panel of claim 1, further comprising an insulating layer interposed between the field control electrode and the pixel electrode and having a trench overlapping the cutout.

12. The thin film transistor array panel of claim 1, further comprising a semiconductor layer located under the data lines.

13. A liquid crystal display comprising:

a first panel including a plurality of control lines including first and second control lines, a plurality of data lines including first and second data lines, a pixel electrode having a cutout, a field control electrode overlapping the cutout, a first switching element electrically connected to the first control line, the first data line and the pixel electrode, and an insulating layer interposed between the field control electrode and the pixel electrode;

a second panel opposite the first panel and including a common electrode; and

a liquid crystal layer interposed between the first and the second panels,

wherein $V_{DCE} > V_p \times (1 + \frac{\epsilon d'}{\epsilon' d})$ for positive V_p and $V_{DCE} < V_p \times (1 + \frac{\epsilon d'}{\epsilon' d})$ for negative V_p where V_{DCE} is a voltage of the field control electrode with respect to the common electrode, V_p is a voltage of the pixel electrode with respect to the common electrode, ϵ and d are permittivity and thickness of the liquid crystal layer, respectively, and ϵ' and d' are permittivity and thickness of the insulating layer.

14. The liquid crystal display of claim 13, further comprising a second switching element for controlling a signal to be applied to the field control electrode.

15. The liquid crystal display of claim 14, wherein the first and the second switching elements are active at different times.

16. The liquid crystal display of claim 15, wherein the second switching element is active before the first switching element.

17. The liquid crystal display of claim 16, wherein the first switching element becomes active immediately after the activation of the first switching element.

18. The liquid crystal display of claim 16, wherein the second switching element is connected to the second control line, one of the data lines, and the field control electrode.

19. A liquid crystal display comprising:

a first panel including a plurality of control lines including first and second control lines, a plurality of data lines including first and second data lines, a pixel electrode having a cutout, a field control electrode overlapping the cutout, a first switching element electrically connected to the first control line, the first data line and the pixel electrode, and an insulating layer interposed between the field control electrode and the pixel electrode;

a second panel opposite the first panel and including a common electrode;

and

a liquid crystal layer interposed between the first and the second panels,

wherein $\frac{C_{LC}}{2C_{DCE} + C_{LC}} > \frac{\epsilon d'}{\epsilon' d}$ where C_{LC} is a capacitance between the pixel

electrode and the common electrode, C_{DCE} is a capacitance between the pixel electrode and the field control electrode, ϵ and d are permittivity and thickness of the liquid crystal layer, respectively, and ϵ' and d' are permittivity and thickness of the insulating layer.

20. The liquid crystal display of claim 19, further comprising a second switching element for controlling a signal to be applied to the field control electrode.

21. The liquid crystal display of claim 20, wherein the first and the second switching elements are active at different times.

22. The liquid crystal display of claim 21, wherein the second switching element is active before the first switching element.

23. The liquid crystal display of claim 22, wherein the first switching element becomes active immediately after the activation of the first switching element.

24. The liquid crystal display of claim 22, wherein the second switching element is connected to the second control line, one of the data lines, and the field control electrode.

25. The liquid crystal display of claim 24, wherein the pixel electrode and the field control electrode are supplied with signals having the same polarity with respect to a voltage of the common electrode for a sequence of activation of the second switching element and the first switching element.

26. A liquid crystal display comprising:

a first panel including a plurality of control lines including first and second control lines, a plurality of data lines including first and second data lines, a pixel electrode having a cutout, a field control electrode overlapping the cutout, a first switching element for applying a first signal from the first data line to the pixel electrode in response to a first control signal from the first control line, and a second switching element for controlling a second signal to be applied to the field control electrode;

a second panel opposite the first panel and including a common electrode; and

a liquid crystal layer interposed between the first and the second panels, wherein the second switching element is active before the first switching element in a sequence of activations of the second switching element and the first switching element and the first and the second signals have the same polarity with respect to a voltage of the common electrode for the sequence of activation.

27. The liquid crystal display of claim 26, wherein the first switching element becomes active immediately after the activation of the first switching element.